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ENDOVASCULAR AND SURGICAL TECHNIQUES

Inferior Vena Cava Reconstruction Using Internal Jugular Vein

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Introduction

The need for inferior vena cava (IVC) reconstruction may occur as a result of planned resection (due to involvement with tumour), iatrogenic injury or trauma. We report the use of internal jugular vein for this purpose.

Technique

A 43-year-old woman underwent an elective right nephrectomy. She had a previous renal injury occurring as a result of a horse-riding accident, leading to uncontrollable hypertension and renal atrophy. At operation, considerable fibrosis and scarring was encountered. During removal of the kidney, the IVC, encased in scar tissue, was inadvertently transected. The torn ends were temporarily ligated once control was established. A blood loss of 17 units was recorded. Assistance from a vascular surgeon was sought.

Upon arrival of the vascular surgeon, inspection revealed that the ends of the IVC had retracted considerably and consequently primary repair was not feasible. Concerns regarding the use of prosthetic material in the venous system led the search for an autograft. The right internal jugular vein was harvested and anastomosed to the proximal and distal ends of the IVC using interrupted 4-0 polypropylene (Fig. 1). Good Doppler flow through the graft was demonstrated at the end of the procedure.

Results

Postoperatively, the patient was commenced on oral anticoagulants. A transfemoral inferior vena cavagram was performed 1 week after the operation which confirmed graft patency though the graft was only 25–30% of the diameter of the native vena cava. The patient was discharged home 17 days postoperatively with a plan to remain anticoagulated for 3 months. Histology unexpectedly revealed transitional cell carcinoma of the renal pelvis. A repeat vena cavagram was performed 6 months later and this confirmed graft patency. The patient remains well 1 year after discharge from hospital.

Discussion

Various methods of reconstructing the IVC have been previously described, including the use of PTFE[1,5] or

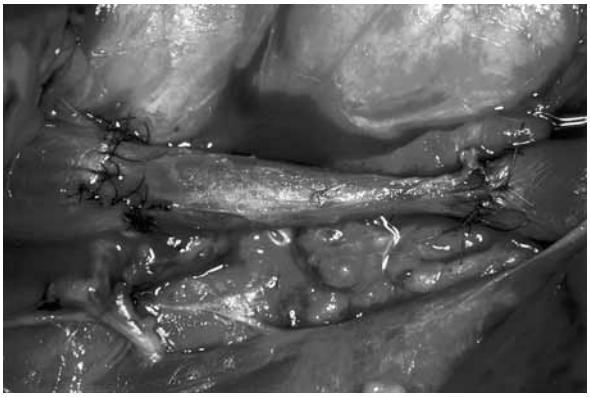

Fig. 1. Intraoperative photograph of reconstructed inferior vena cava: the lower end appears narrowed due to temporary spasm of the graft immediately following completion of the distal anastomosis.

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PET[2] (Dacron) prosthetic grafts and venous autografts (superficial femoral vein,[3] external iliac vein[4] and spiral saphenous vein[5]). We have not, however, been able to find any reports on Medline of internal jugular vein being used for this purpose. The concern with using prosthetic grafts in the venous circulation lies in their tendency to thrombose or become infected.[4] Autogenous vein was therefore our preferred graft material.

The obvious problem of IVC grafting is that the diameter of the IVC is greater than that of most commonly used graft vessels. Superficial femoral vein has been described for use as a replacement after removal of infected grafts and for IVC reconstruction[3] but this can lead to local complications in the lower leg. Spiral saphenous vein grafts have also been used[5] but these result in long suture lines which may increase the tendency to thrombosis and are also time consuming. The use of external iliac vein for IVC replacement has also been described.[4]

The internal jugular vein appeared to us to be the ideal conduit. Not only does it have a large diameter, but healing in the neck is such that its harvest is virtually without complication.

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